TRACTION POWER DESIGN

• TP Simulation Study- Simulation runs for South and North Corridor.
• Prefabricated Traction Power Substations furnished by SANDAG:
  13 NEW SUBSTATIONS

• Existing Substations (Modifications by Mid-Coast Contract) Continue working with SANDAG and MTS for modifications and SCADA upgrades to the existing Green Line Substations:
  1. Olive TPSS
  2. Bean TPSS
  3. Congress TPSS
Overhead Contact System – Configuration

- OCS configuration for main line shall be Double Messenger Wire Catenary Auto-Tensioned (DMSCAT) System according to TPSS simulation result
- OCS configuration for crossovers shall be Simple Catenary Auto-Tensioned (SCAT) System
- All OCS system depth shall be 4’-4”
- All OCS poles shall be tapered round poles
- Counterweights for BWA poles are located outside of the termination poles
Typical Standard OCS Structure
Typical OCS Overlap Arrangement
Existing Green Line Sectionalizing Modification
Existing Green line to New Mid-Coast Extension
Sectionalization
Mitigation Section from UCSD West and UCSD East Passenger Station
Communications System

- Communications System includes the following subsystems:
  - Wide Area Network
  - Public Address System
  - Closed Circuit Television System (CCTV)
  - Fire Alarm System
  - Access Control/Intrusion System
  - Radio System
  - UPS System
  - SCADA System
  - Fare Collection interface
  - Wireless CCTV Node for onboard train live streaming
  - Communications Facilities/ Cabinets
Midcoast’s Optical Ring Network Topology
SYSTEM OVERVIEW

- DESIGN BASED ON FRA DEFINITION OF TRAFFIC CONTROL SYSTEM
- BI-DIRECTIONAL OPERATION ON BOTH TRACKS
- ELECTRIFIED ELECTRONIC CODED TRACK CIRCUITS
- AUDIO FREQUENCY OVERLAY TRACK CIRCUITS
- VITAL PROGRAMMABLE LOGIC CONTROLLER (PLC)
SYSTEM OVERVIEW

- TRAIN TO WAYSIDE COMMUNICATIONS (TWC)
- VITAL & NON-VITAL FIBER NETWORK
- ROUTE ESTABLISHED BASED ON TRACK OCCUPANCY & TWC LOGIC
- OPERATIONS CONTROL CENTER – CTC CONTROLS & INDICATIONS
- APPLICATION LOGIC DEVELOPMENT BASED ON EXISTING SOUTH LINE (BLUE LINE) SYSTEM
OLD TOWN SEGMENT
ASH STREET TO TAYLOR STREET

- EXISTING GREEN LINE SERVICE
- NEW INSTRUMENT SHELTERS
- NEW LED SIGNALS
- VITAL & NON-VITAL FIBER NETWORK ON Catenary POLES
- HIGHWAY GRADE CROSSINGS – VITAL PLC & SOLID-STATE CROSSING CONTROLLERS
OLD TOWN SEGMENT
ASH STREET TO TAYLOR STREET

- CROSSING TRAIN DETECTION DESIGNED TO UTILIZE DIRECTIONAL INTERLOCKING LOGIC
- PSO 4000 CROSSING ASSEMBLIES
- UPGRADE FLASHING LIGHT SIGNALS WITH GATES
- UPGRADE LAMPS ON ALL STRUCTURES TO LED
- NEAR SIDE LOGIC AT STATIONS
- UPGRADE OLD TOWN INTERLOCKINGS
NEW INSTRUMENT SHELTERS
LED SIGNALS
VITAL PLC CONTROL
TWC & PUSH-BUTTON ROUTE SELECTORS AT INTERLOCKINGS
VITAL & NON-VITAL FIBER NETWORK
TYPICAL ABS LOCATION
TYPICAL ABS CONDUIT SYSTEM
REGULATORY REQUIREMENTS

- TITLE 49 CODE OF FEDERAL REGULATIONS (49CFR)
- PART 219 CONTROL OF DRUG & ALCOHOL USE
- PART 228 HOURS OF SERVICE
PERSONNEL QUALIFICATIONS

- SIGNAL ENGINEERS
- APPLICATION SOFTWARE ENGINEER(S)
- SIGNAL SUPERVISOR(S)
- CONSTRUCTION FOREMAN(S)
- LEAD WIRE PERSON(S)